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things. The whole purpose of the inquiry is to obtain a summary form of representing facts so as to afford a convenient and economic means of dealing with them practically. "The existential point of view" is neither that of common-sense nor that of philosophy: it is an artificial simplification which has its own logic and its own justification, adopted and maintained by scientific procedure in accordance with carefully defined assumptions. It may fairly be characterized as an external form of representation, indispensable for its own purposes but as contributing nothing directly to philosophical understanding. Like Descartes's material bodies, scientific phenomena may be said to have no insides. In dealing with them the mind moves, that is, on the plane of external existence and represents or pictures the relations between them in terms of a logic derived from space. The statement said to have been made by the late Lord Kelvin that he could understand a theory only when he was able to represent it in a drawing, illustrates well the point I have in mind. This seems to be the form of intelligibility toward which all the sciences look as their ideal.

But philosophy in its own domain has no concern with the bare form of existence. To achieve the form of intelligibility at which it aims it is indeed necessary that the mind shall understand the truth that is contained in this abstract standpoint, but it has also to free itself from the domination of existential imagery in order to rise to freedom and universality. It is, however, important to note that freedom from imagery is not identical with withdrawal from what is actual and concrete. The real world is the world of significant individual wholes constituted by reflective experience; not that of the superficial and conflicting impressions of practical life.

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## MEASURES OF INTELLIGENCE AND CHARACTER

ONE of the most important questions that arise in connection with the widespread use of the intelligence examination is: What part does intelligence, as measured by such a test as the Army Alpha, play in success in an occupation? The report of the psychological examining in the U. S. Army provides valuable material pertaining to this question. The median intelligence for various occupations is given, together with the range of the middle fifty per cent. (*Mem. Nat. Acad. of Sci.*, 1921, XV, pp. 819 ff.). The range of intelligence within a given occupation is great and the overlapping among the occupations is also great, so that for pur-

poses of vocational guidance the occupations included in the study would have to be classed into about three groups, such as the professional, the clerical and skilled labor, and the labor class. For a finer classification other criteria must be adopted.

Two important indicators might be obtained from such data, namely, the minimum intelligence needed for a given occupation; and that degree of intelligence that one needs in order to be better than the average person engaged in the occupation. The value of this second indicator rests upon the assumption that the greater the intelligence of the individual the greater his success in any occupation. The data do not show whether or not this is the case. If intelligence were the only condition of success, then degree of success might be prophesied from degree of intelligence. But other determining factors must at least be sought.

The views expressed by the fourteen psychologists who recently contributed to a "Symposium on Intelligence" conducted by the *Journal of Educational Psychology* (1921, Vol. 12, Nos. 3, 4, and 5) show the increasing importance which is being attached to the so-called *character* traits. Although, in every case but one, defining intelligence so as to exclude the character traits, a plea was made for recognition of their significance in determining success. Even in college work where intelligence is considered a prime requisite, an important place is being assigned to these traits. The limit of correlation to be expected between an intelligence test and performance in college is probably between  $+.60$  and  $+.65$ . Other conditions of success are physical health, interest, aggressiveness, social qualities, *etc.*, in short what are usually comprised in the term "character traits" (with the possible exception of physical health).

The statement has been made recently that there are certain kinds of work for which the optimum degree of intelligence is not the maximum degree, for example, in the case of messenger boys, sales-clerks and even elementary school teachers; and that to seek for the highest intelligence available may represent misguided effort. Such a view need not imply, I believe, that a low degree of intelligence is in itself really better for a given job than a higher degree of intelligence would be, but rather that one is more likely to find along with a low degree of intelligence those character traits that make for success and satisfaction in certain kinds of work. One might, for example, expect to find the traits that bring success as a scrub-woman or automatic machine tender and leading to satisfaction in these simple forms of manual labor accompanying a low rather than a high intelligence.

The study by Bregman (*Journal of Applied Psychology*, 1921,

V, 127-151) of sales-clerks and clerical workers shows that with a given group of applicants the more successful *sales-clerks* come from those that get a relatively low score in her series of tests; while the more successful *clerical workers* come from the group that gets the relatively high score. That is, these tests show a negative correlation with sales ability and a positive correlation with clerical ability. The tests used to make this distinction between sales-clerks and clerical workers are those commonly used as parts of intelligence tests, such as completion of sentences, tests of information and the various kinds of association tests. When their scores are combined they give somewhat of an intelligence rating. Now, is a relatively low intelligence required for success as a sales-clerk, or does one succeed in spite of low intelligence, because of the presence of other than intelligence traits,—the character traits?

Otis (*Journal of Applied Psychology*, 1920, IV, 339-341) found a zero correlation between success as a mill worker and performance in his intelligence test. He concludes his report thus: "Intelligence is not only not required in a modern silk mill for most operations but may even be a detriment to steady efficient routine work. What qualities are required remains to be sought. Whether they are measurable is doubtful. They may be stolidity, patience, inertia of attention, regularity of habits, *etc.*" The question may be asked: Is intelligence really a detriment in such occupations, or is it merely likely to have accompanying it certain character traits not suited to the task?

If the degree of intelligence possessed by an individual is to be taken as the indicator of the presence of certain desirable or undesirable character traits the correlation between the two must be high. A survey of the available material on the relation between intelligence and character traits shows that the correlation is positive but that it will probably not go higher than  $+.50$ . This correlation of  $+.50$  accounts for the fact that one can find desirable character traits in persons of very low intelligence. If the presence of one can not be taken as the sign of the presence of the other, then both must be measured. It is quite important to find out the upper limit as well as the lower limit of intelligence for a given kind of work merely as a matter of economy of intelligence. But the need for simple character tests is just as great or even greater. The rate of labor turnover in certain types of work may well be expected to be greatest among the workers of high intelligence, until a measure of the other necessary traits is used along with the intelligence measure in selecting them. The following quotation from Fernald (*J. of Abnormal Psychology*, 1920, XV, 4 ff.) illus-

trates well the importance of measuring both intelligence and character in vocational work:

"Two adults, sane personalities, may be contrasted. The one, *A*, is a confidential clerk who has forged his employer's signature at least three times. He passes 'adult' intelligence tests with credit. His literary and æsthetic tastes are commendable and his thought mechanisms as discovered by tests and also as discerned in ordinary social and business intercourse are efficient and trustworthy. In conversation he does not justify forgery; but admits it is never justifiable. Yet his love for fast living, fine clothes, automobiles, costly companionship, *etc.*, have occasioned his failure by forgeries executed most skillfully. His knowing, inventing, associative and reasoning capacity is not at fault; but his capacity for resisting, for denying himself gratification and for acting on the promptings of his own good foresight are at fault. His weakness is one of behavior and in the field of character, and is not one of thinking, and so in the field of intelligence.

"The other personality, *B*, is a farm 'chore boy,' an imbecile as determined by intelligence tests (I. Q. 39), whose conduct record is good. He milks cows, carries wood and water, *etc.*, under direction and is in his contracted sphere of activity an economic success. He is well disposed toward his environment and habitually reacts acceptably to stimuli within his comprehension capacity. His weakness is a paucity of knowing, inventing, association, thinking, *etc.*, a failure in the field of intelligence and not in character. The findings of intelligence tests only in these two cases are that *A* is of at least ordinary intelligence while *B* is an imbecile. The findings of character study only are that *A* is legally an offender, an economic parasite and a social menace, while *B* is law abiding, a producer and no menace. Consideration of both fields of inquiry affords a far broader and more illuminating and therefore true basis of comparison than is available from the consideration of either field alone. In fact, conclusions drawn from investigations in either field to the exclusion of the other are misleading."

If measures of both these qualities are necessary for practical purposes, there would be an advantage in having a test that would measure both together—a measure of efficiency or adequacy or competence. Such a test would make unnecessary any sharp distinction between what is intelligence and what is not, and would arouse less criticism when applied in business and industry. The layman can not readily make such a distinction, while his crude inference that the more stupid one is the better he can do a certain job is likely both to arouse opposition and to introduce certain complications into the work of testing. The distinction is probably an arti-

ficial one, anyway, depending upon which of the many definitions of intelligence shall be accepted. In the "Symposium on Intelligence" mentioned above there was at least one psychologist who defined intelligence broadly enough to include what are ordinarily called character traits. Thus Freeman says, "I conceive intelligence to be a somewhat more inclusive capacity than is implied when it is used for a name for our present tests. . . . The mental capacity designated by the term intelligence seems to me to include besides the elements which are usually measured by our tests, certain other types of capacity which they measure not at all. . . . The characteristic which I am referring to is sometimes called temperament or moral character."

Thorndike, in an article on "Intelligence and its Uses" (*Harper's Magazine*, 1920, CXL, 227-235), keeps the layman out of difficulty by speaking of three intelligences that every one possesses, the abstract intelligence, the mechanical intelligence and the social intelligence. This last includes many, if not all, of the so-called character traits. The definition of intelligence as the "capacity for adaptation or adjustment to environment" would seem broad enough also to include the character traits. Fernald, in the article quoted above, suggests that intelligence may vary in *degree*, giving what are called grades of intelligence, and in *quality*, giving what are called character traits.

With some modification of content, method of administration, and with supplementary scoring such a test as the Army Alpha might be made to yield measures of neatness, accuracy, speed of decision, freedom from inertia, assurance, willingness to take a chance, tenacity or perseverance, honesty, *etc.* The total score from such a test would give a measure of efficiency or *competence*. By proper weighting of the different ingredients of the total score, measures could be provided for different occupations. Thus, an occupation for which a low degree of intelligence is adequate, but which requires honesty and steadiness could be measured by the efficiency test with the intelligence components and the character components given suitable weights. The result could be expressed in a total score for the occupation. It would be still more desirable to express the efficiency in the form of a profile, in which each component of the test, *e.g.*, ability to follow instructions, arithmetical ability, ability to work with symbols, range of information, honesty, assurance, *etc.*, could be separately reported and measured against a standard or pattern for any occupation.

Such a combined measure of intelligence and character, if used for vocational purposes, would prevent the waste of high grades of intelligence in positions where it is not needed and would enable

those of low intelligence to be located where their capacity would be adequate and where their character traits would make them successful. There may be many places in our business and industrial system where Fernald's case *B* would fit very well, and where an individual of a much higher intelligence might find the monotony intolerable. To refuse an occupation in business and industry to all persons with an intelligence under seventy per cent. of normal without examination of their character qualities may some time appear to be one of the greatest of human and economic wastes. In the individual of low intelligence but stable character qualities, may lie a partial remedy for the restlessness induced by extreme specialization and automaticity of work.

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#### THE WORD INTEGRATION AND A FEW REMARKS ON THE PALEONTOLOGY OF WORDS

TWO correspondents, Professors Wilmon H. Sheldon of Yale University, and W. A. Merrill of the University of California, have written me that "integration" has nothing to do with *gradior*, as I assumed it to have in my article "The Need of a New English Word to Express Relation in Living Nature." (This JOURNAL, August 18, 1921.) And since Merrill is a Latinist by profession, there seems nothing for me to do but to admit that at least I was "wrongly advised" as he considerably puts it. What makes the error the more troublesome to me is the fact that I do not remember the source of my advice, nor, so far, am I able to relocate it.

Professor Merrill also informs me that while the Latin *ferre* sometimes means, as I stated, bearing in the sense of producing, the producing is not the kind I meant. It never means producing in the sense of biological reproducing, I understand him to mean. It appears, consequently, that the etymological part of my effort to justify conferentiation as the new word of which our language is in need, was quite unfortunate.

It is, however, a satisfaction to be told by Professor Merrill that he sees no objection to the word I propose if I think it is needed; for, he says, "The etymology is of no importance, as no one thinks of an automobile as a self-mover."

Perhaps, then, I ought to be sorry that in this instance I did not follow, as according to my rule I should have done, the familiar advice Mr. Lincoln is said to have given in a lecture to law students: Never try to prove anything you do not have to, because you may thereby be driven into trying to prove something you can't.

But there is an aspect of the use of words which goes much deeper